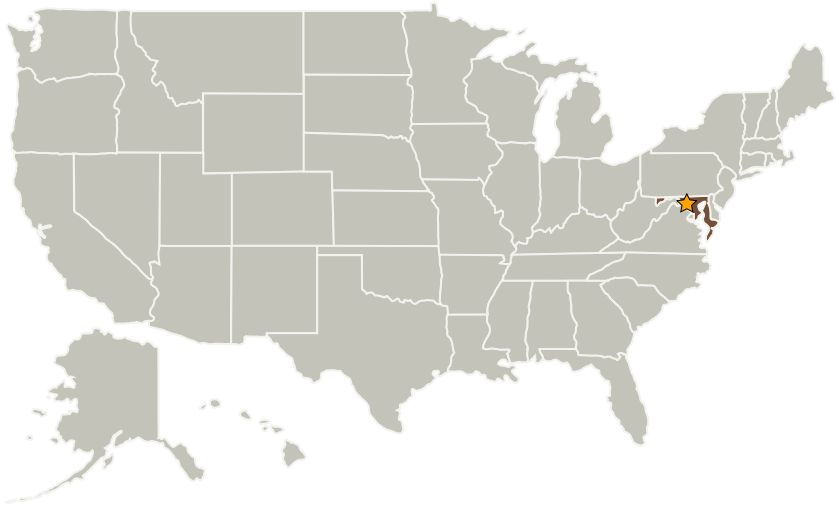
Low Cost Phased Array Antenna System, Phase II

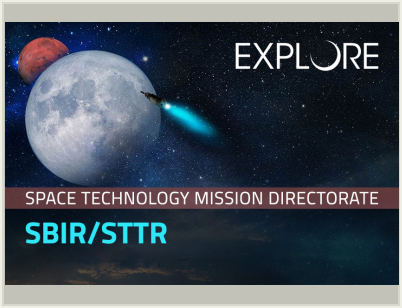
Completed Technology Project (2005 - 2007)

Project Introduction

JEM Engineering proved the technical feasibility of the FlexScan array?a very low-cost, highly-efficient, wideband phased array antenna?in Phase I, and stands ready to develop it into a fully-functional, flight-qualifiable prototype in Phase II. JEM developed an S-Band (2.0-2.3 GHz) antenna array design appropriate for the stratospheric balloon application through requirements definition, modeling, and performance predictions. The critical technology for this array is an electrically-controlled Variable Delay Line (VDL), used to provide true time-delay for beamsteering. VDLs were designed, built and tested, and shown to have excellent performance. The VDLs were tested over 2.4 million cycles without degradation, indicating good life, especially for the balloon application. A 4-port linear beamformer was built, and used to validate the beamformer concept. The objective of the proposed 24-month Phase II effort is to develop, prototype, and demonstrate a flight-qualifiable FlexScan phased array that achieves the bandwidth, antenna gain, and scan range required for a balloon-borne TDRSS data link in S-band, while meeting environmental requirements. Upon completion of Phase II, the FlexScan array will be ready to commercialize for the balloon-borne application, with other NASA and non-NASA commercial applications soon to follow.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
JEM Engineering LLC	Supporting Organization	Industry	Laurel, Maryland

Primary U.S. Work Locations
Maryland

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.6 Innovative Antennas